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that enzymes have been the subject of considerable careful investigation during the past fifteen years and that their nucleoproteid nature which he has just "discovered" is now in fact being given up by the men who are most prominent in the chemistry of the enzymes. Only a few months ago Pekelharing prepared a pepsin which contained no phosphorus; this pepsin still contained a minute trace of iron, as shown by qualitative tests, but it was too small to be determined quantitatively and Pekelharing paid no further attention to it. There is no reason for supposing that Pekelharing could not purify this pepsin still further and thus get rid of the last traces of iron, as he has already removed the last traces of phosphorus, should there be any sufficient object in his doing so.

Since the only experimental evidence cited by the author is thus meaningless there is scarcely any point in following him in a review of this kind through other subjects, such as synthesis of living matter, growth, cell division, reproduction, muscle contraction, the activity of the sense organs, and the chemical processes of the central nervous system. The discussions seem all like the products of a wandering mind whose scientific bearings have been completely lost.

It seems surprising that a firm like that of Gustav Fischer at Jena could have been induced to publish a work of this kind.

O. F.

A New Laboratory Manual of Biology. — The teacher of biology is confronted not only with the problems of his own science, but with those of how best to teach it, and a laboratory manual is a provisional answer to many questions of the second kind. From this standpoint Hargitt's¹ *Outlines* will be of much service to teachers. It abandons the older method of beginning with the simplest representatives of animals and plants which are at the same time least familiar and most difficult of study, and adopts the more recent practice of introducing the subject by well-known types, in this instance the frog and the fern. Then follow exercises on the animal and the vegetable cell, and finally a series of type animals and plants ranging from hydra and the molds to the grasshopper and flowering plants. The mingling of plants and animals in the latter part of the work, though a time-honored practice, destroys the unity which the plant and the animal kingdom ought to show and substitutes nothing of special value for it. The text, which is for the most part clear, is

¹ Hargitt, C. W. *Outlines of General Biology*. C. W. Bardeen, Syracuse, N.Y. 164 pp.

unaccompanied by figures, thus throwing the student more completely on his own resources. Here and there it is perhaps too descriptive, as, for instance, on page 74, where the form of the jellyfish might have been left for the student to make out for himself. Occasionally terms could be improved. Thus, on page 19, in the account of the external apertures of the frog, *anus* is used for *cloacal opening*; and on page 98 the plates of the starfish are described as *bony* instead of *calcareous*. Except for the wrong font of *s*'s on page 38, the proof reader's work seems to have been done with much care. These defects, however, are insignificant compared with the good qualities of the book, which will undoubtedly find its way to many laboratories where plants and animals are dealt with in a single course.

ZOOLOGY.

Gegenbaur's Comparative Anatomy of Vertebrates.¹—The second and concluding volume of this masterly work deals with the digestive and respiratory organs, the organs of circulation, and the urogenital system. The present volume is only a little over two-thirds the size of the first one, and its real subject-matter is still further restricted, in that about one-fifth of its 700 pages is given up to an index of some 20,000 entries, covering both volumes. There are 354 text illustrations. One impression made by the perusal of this volume, as compared with the first, is some lack of completeness. Thus, in the section on the pancreas, though the ducts of Wirsung and of Santorini are described, no exact statement is made as to their relations to the anlagen of the gland, and the interesting and important phases presented by them in different mammals is passed over without comment. The lungless condition of many salamanders is only briefly noticed (p. 302). The description of the arterial system is very fragmentary. Almost no mention is made of the coronary arteries, whose conditions in the fishes and in the higher vertebrates present many important modifications. The exact comparison of the aortic arches of the amniota with those of fishes is nowhere very clearly brought forward. Although the relations of the azygos and hemiazygos veins of mammals to

¹Gegenbaur, C. *Vergleichende Anatomie der Wirbelthiere*. Bd. ii. Leipzig, W. Engelmann, 1901. viii + 696 pp.